The Lower Paleolithic Occupation of Iran

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Bounded in the north and south by the Caspian Sea and Persian Gulf respectively, Iran is a natural bridge connecting southwestern Asia to southern and central Asia and therefore could have been a main route for hominin expansion eastwards. Despite its strategic location, however, it has produced little evidence for early hominin occupation. This evidence generally comprises stone artifacts with no clear stratigraphic contexts and no associated faunal remains. Therefore, compared to the Levant, the Caucasus or the Indian subcontinent, it has been one of the least-known regions of Southwest Asia. Here we present a preliminary synthesis—using information from surveys conducted by western researchers during the late 1950s through the 1970s, data from recent field surveys, re-analyses of old collections by Iranian researchers, and research undertaken by joint Iranian and foreign teams during the last decade—that yields new data about the Lower Paleolithic occupation of Iran and its probable relations with neighboring regions.

Since the 1960 discovery of a biface on the terrace of the Qara Su River in the intermontane valley of Kermanshah, at least ten localities or groups of localities that can be assigned to the Lower Paleolithic period have been recorded in various parts of Iran. These localities include gravel deposits along the Kashafrud River in northeastern Iran, the Karun, Kargar, Mashkid, and Ladiz Rivers in the south and southeast, Sefidrud River in the North, Mahabad River in the northwest, a cave site in western Alborz, and some surface assemblages and isolated finds from various parts of the country.

In general, these Lower Paleolithic sites are associated with waterside locations such as river terraces and lakeshores, although there are some sites on hilly terrains with raw material outcrops. The waterside locations were not only important as water sources, but also for other essential resources such as raw materials (gravels), plants, and game. The known sites usually produced small surface assemblages and in each site artifacts number fewer than 100 to 150. Only a few sites have yielded larger numbers of artifacts; these are large and extended workshops associated with raw-material sources. Unfortunately, with the exception of one cave site, none of these sites have produced animal remains or other evidence for the subsistence activities of early hominins in Iran. Thus, our brief discussion is essentially limited to stone-artifact assemblages. For other aspects of Lower Paleolithic occupation, evidence from elsewhere in the old world has been used.

The available Lower Paleolithic record from Southwest Asia indicates the importance of the region in understanding initial hominin dispersal toward both Asia and Europe. According to evidence from Dmanisi in the Caucasus region, hominin presence in Southwest Asia reaches back to the Plio-Pleistocene (Gabunia and Vekua 1995). In addition to Dmanisi, there is evidence for early hominins at Ubeidiya, Yiron, and Erq el-Ahmar in the Levant, and Riwat in Pakistan dating back to the late Pliocene–early Pleistocene (Bar-Yosef 1998; Dennell 1998). Located as it is between these regions, it has always been assumed that Iran has the potential to provide early evidence of hominin colonization of this part of Asia.

It is feasible that Iran, like some other parts of Southwest Asia, was first colonized during the Plio-Pleistocene. We do not have enough evidence to determine environmental conditions and climatic changes during early hominin expansion in the region, but it is clear that such environmental factors had a significant effect on the availability and variability of floral and faunal resources, which in turn affected distribution and survival of hominin populations in the region. Grassland-type vertebrate fossils from the late-Miocene localities of Maragheh in northwestern Iran indicate the presence of a savannah landscape nine and a half to seven million years ago (Campbell *et al.* 1980). These localities also yielded some fossil hominoids belonging to *Mesopithecus pentelici*. Later, in the Pliocene period, Iran was part of an extensive grassland belt that extended from Africa to East Asia. During the Plio-Pleistocene and Lower Pleistocene, these grasslands were still largely present (Dennell 1998). It seems reasonable to suppose that early hominins who expanded eastward could survive in this region since it had an environment similar to their African homeland. This early wave of hominins had simple core and flake industries as evidenced by stone assemblages excavated at the Plio-Pleistocene site of Dmanisi and at some other sites in the Levant and Pakistan.

Probable evidence for this early population includes sites in the Kashafrud Basin in northeastern Iran, where late-Pliocene and early-Pleistocene exposures are widespread. These sites were discovered and sampled in 1974–1975 by Thibault and Ariai (Ariai and Thibault 1975) in the course of their survey of the Kashafrud Basin. They are located some thirty-five to eighty-five kilometers southeast of Mashhad, at a distance of one to ten kilometers away from the main river course.

Thibault and Ariai recognized three major alluvial units in the basin, which they named Units I, II, and III, top to bottom. They tentatively attributed these units to the Lower, Middle, and Upper Pleistocene. The type section of Unit I, near Abravan, is a thirty-meter-thick accumulation of alternating layers of gravel and sand. All artifacts were collected from the surface of level 1 and from the eroded talus slope of gravel level 3. The artifacts from the surface were abraded, while those collected at the foot of the section under level 3 were in fresh condition, which may indicate that they originated from level 3. The presence of a gravel layer (layer 3) overlying a thick sandy layer is interpreted as evidence for the presence of a vast and shallow lake that gradually filled the basin in the late Pliocene.

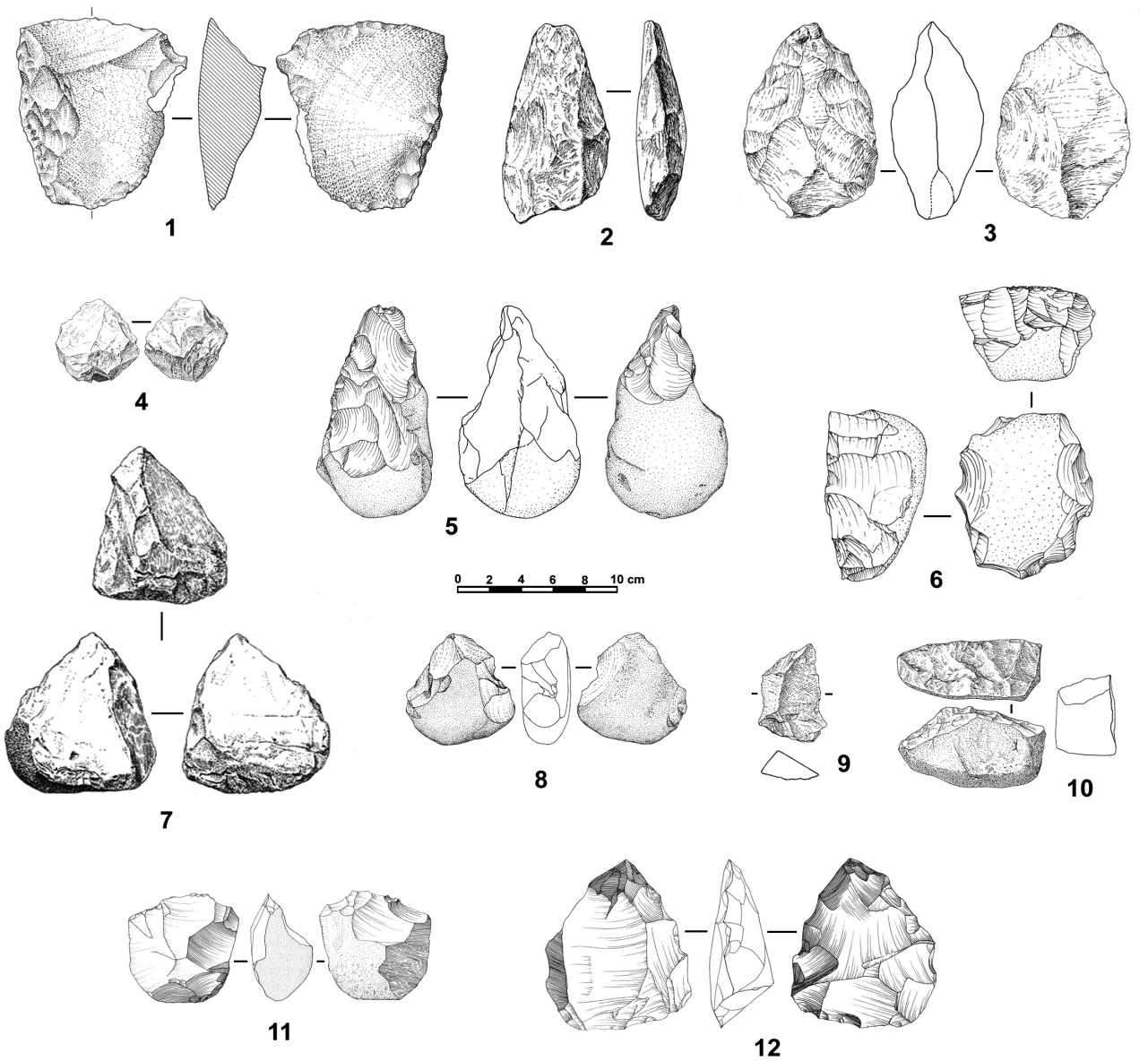
The localities in the Kashafrud basin collections yielded eighty pieces that come from seven sites; all are now housed in the National Museum of Iran. The Abravan site yielded the largest collection, with thirty-nine pieces. Other important collections are Chahak (nine pieces), and Baghbaghu (four pieces). There are four more collections (with no clear provenience) from east of Mashhad and a small collection of four artifacts from Delbaran located about thirty-two kilometers to the south-southwest of Mashhad, far from other occurrences.

Biglari's reexamination of the Kashafrud collections revealed that some of the claimed artifacts are in fact natural objects—quartz pebbles, cobbles, or fragments with no clear human modification except for some fracture surfaces with irregular scars that could have been the result of fluvial mechanical action. Quartz pebbles and cobbles are abundant in the gravel of Unit I, level 3. Because quartz is brittle and thus more easily chipped than other rock types, it was preferred, even though volcanic rocks such as andesite were also present in the gravels. This rock type usually produces flakes with sharp edge, which is very effective for cutting activities. Because of quartz's friable nature, producing flakes with it requires experience and control. Its use indicates that early toolmakers at Kashafrud were skilled and had good knowledge of quartz fracture mechanics.

The assemblages are homogeneous in technology as well as raw material type. They include cores and core forms (core-choppers), whole flakes, flake fragments, chunks/debris, and hammerstones. The presence of debitage products, cores, and hammerstones indicates that complete reduction sequences took place on the sites that were close to the paleolake of Kashafrud. The cores were knapped by direct percussion and in some cases by bipolar reduction. Those cores knapped by the direct percussion technique can be classified into one of four categories—unipolar (the dominant category), multiple, discoid, and indeterminate. The cores vary in size between thirty and ninety-four millimeters with a mean of sixty millimeters. They frequently show fewer than five removals from unprepared platforms that are mostly natural surfaces with appropriate angles. An abundance of raw material in the local gravels may account for the low degree of core reduction. As mentioned above, one of the techniques used to extract sharp flakes from pebbles is the bipolar technique where the knapper sets a pebble on a flat rock (anvil) and hits it from above with a hammerstone. This technique helps the toolmaker to produce the largest flakes possible from the pebble. It is especially useful when a pebble is too small or rounded to hold in one hand, as was the case at Kashafrud. There is little evidence for secondary modification of the artifacts and the most important tools were probably simple flakes that provided a useful sharp edge. A few modified tools could be classified as scrapers, notches, and awls, and some core forms could have been used as choppers.

This map indicates the distribution of known Lower Paleolithic localities and findspots in Iran. (Blank topographic map of Iran after Deutschen Bergbau-Museums Bochum 2004, with some modifications.)

Ariai and Thibault (1975), comparing the Kashafrud industry with final Oldowan assemblages from East Africa, attributed the



Selected artifacts from some of the mentioned Lower Paleolithic sites in Iran. 1. cleaver from Shiwatoo (after Jaubert *et al.* 2006); 2. handaxe from Quri Goll (after Singer and Wymer 1978); 3. handaxe from Ganj Par (after Biglari *et al.* 2004); 4. polyhedron from Sahand region (after Sadek-Kooros 1976); 5. biface from Amar Merdeg (unpublished); 6. core-scraper from Ganj Par (unpublished); 7. trihedral pick(?) from Sahand region (after Sadek-Kooros 1976); 8. pointed chopper (partial biface?) from Amar Merdeg (unpublished); 9. flake from Kashafrud (after Thibault 1977); 10. unipolar core from Kashafrud (after Thibault 1977); 11. corechopper from Pal Barik (after Mortensen 1993); 12. handaxe from Pal Barik (after Mortensen 1993).

Kashafrud industry to the pre-Acheulian. The composition and characteristics of the industry, such as a high percentage of single platforms (including core-choppers), moderate numbers of bipolar cores, the casual nature of retouched artifacts, the dominance of a single raw material type, and the high numbers of cortical elements, resemble both East African Oldowan assemblages and those from West Asian sites such as Dmanisi (de Lumley *et al.* 2005).

Hume (1976) identified a Lower Paleolithic core and flake industry for the southeastern region of Iran, based on lithic assemblages collected on gravel terraces of the Ladiz, Mashkid, and Simish Rivers in the Sarhad plateau between1966 and 1967. During surveys in the Ladiz valley, seven localities were recorded on the river terraces at an altitude of 1400 to1500 meters above sea level and ten more localities were recorded along the Mashkid and Simish Rivers between 1150 to 1250 meters above sea level. The type assemblages for Ladizian Industry come from two localities along Ladiz River that according to Hume are undisturbed or only slightly disturbed occupational floors. This is demonstrated by presence of some refitting groups from the sites, one of which includes a core and a substantial number of flakes revealing a nearly complete reconstruction of a cobble. The most common raw material employed was quartzite, although chert and jasper were also

used to some degree. These rock types are local and obtained from gravels along the rivers.

Unipolar cores are the most frequent core type, followed by other types such as those with double, irregular, or multiple platforms. The bipolar technique is applied on chert and jasper nodules that are small in size. Tools consist of various types of scrapers, notches, denticulates, points, simple burins, and borers. Some of these tools show bifacial retouch along their edges. Core-choppers also occur in the industry, although in low frequency (Hume 1976).

Based on the geomorphologic context of the localities and the typo-technological characteristics of the assemblages, Hume suggested that the Ladizian Industry was produced between the late Riss-early Wurm glacial periods (between 130,000 and 110,000 years ago). But this chronological framework has been criticized because it is based on the traditional Pleistocene glacial sequence of Europe (Smith 1986).

If it is demonstrated that the Ladizian Industry belongs to a terminal Middle Pleistocene–early Upper Pleistocene period (dating to marine isotopic stages 6 and 5), we may assume it is an early Middle Paleolithic industry with some affinities with industries from the Indian subcontinent. Thermoluminescence dates available from a Middle Paleolithic site in western Rajasthan (about1300 kilometers east-southeast) indicate a terminal Middle Pleistocene to early Upper Pleistocene age (150,000–100,000 years ago) for its lithic industry (Misra 1989). Ladizian and northern Indian industries also use similar raw materials and they contain similar tool types.

A quartz core-chopper from Kashafrud, northeastern Iran. *Photo courtesy of Fereidoun Biglari.*

Although Hume did not mention the use of the Levallois method in the Ladizian Industry, it is represented in some surface occurrences on the Makran coast (about four hundred kilometers to the southwest) in association with denticulated pieces and core-choppers (Vita-Finzi and Copeland 1980). An industry similar to the Ladizian has been reported from some surface localities at Khash valley that are located about ninety kilometers to the south of the Ladiz valley (Marucheck 1976). Most of these localities are associated with raw material outcrops and seem to have functioned as workshops.

Probable evidence for late Lower Paleolithic occupation comes from the Minab region in southeastern Iran. In 1977, a joint French-Iranian team led by Thibault collected some lithic assemblages on the surface of terraces (25–50 meters above sea level) spreading at the foot of the Zendan range, north of Minab, which are attributed to the Paleolithic and Epipaleolithic periods (Thibault 1977). The area that is located between Zendan range and strait of Hormoz coast is characterized by Quaternary alluvial deposits stratigraphically organized in a four-level sequence that is dissected by the drainage network of the Kargar and Karun rivers.

On the highest terrace of the Kargar and Karoun Rivers, four Lower Paleolithic lithic samples were collected that consist of fifty-one artifacts made from quartz, radiolarite, and volcanic rocks. The collections include flakes, flake fragments, cores, and tools such as side scrapers, denticulates and notches and one partial biface. Debitage products are generally small in size and cores also have small dimensions. Nearly half of the assemblages are composed of cores that generally have few flake removals and platforms that lack any preparation (Thibault 1977). The partial biface (12 × 9 millemeters), made from grayish green volcanic rock, has some retouching on its right and distal edges at one face and three large removals on other face. The retouching on the distal part resulted in a transverse edge resembling a cleaver bit.

The proposed age for the Minab occurrences on the highest terraces places them, like the Ladizian Industry, within the new chronological framework of the regional Middle Paleolithic. According to Regard and colleagues (2005), the highest terrace on the Kargar and Karoun Rivers may have formed during a humid period corresponding to the deglaciation between isotopic stages 6 and 5e, before the onset of the last interglacial conditions. New dating methods used for Middle Paleolithic sites in Western Asia and South Asia specify that the Middle Paleolithic began sometimes between 200,000 and 250,000 years ago, which agrees with new dates for the European Middle Paleolithic. Although we should not dismiss the possibility that in some areas, the Lower Paleolithic tool traditions persisted well into late Middle Pleistocene and even into the last interglacial.

One of the proposed routes of hominin entry into Iran is from northern Mesopotamia and along the southwestern foothills of the Zagros range (Rolland 2001). Some have suggested that Lower Paleolithic groups penetrated only rarely into the Zagros or beyond it to central Iran (Smith 1996). But the recent discovery of a probable Acheulian occurrence at the western edge of the central Iranian desert (Kavir), suggests that the Zagros mountain range was not a major barrier to population expansion into central Iran during the Lower Paleolithic period.

The Geleh site is situated about ten kilometers northwest of Kashan, at an elevation of 1100 meters above sea level, at the opening of the narrow side valley of Tang-e Khozaq on the eastern slopes of the Karkas mountains. The site is limited on the east and west by two shallow streambeds that lead to the

main stream channel running to the Kashan plain. The area is covered by a dense scatter of angular rocks that are mostly trachyandesite. The outcrops of this igneous rock are located along northern margins of the valley overlooking the area. This site was recorded by Biglari and Heydari during a preliminary Paleolithic reconnaissance of the Kashan region in 2003 (Biglari 2004a). Seven large flakes were collected in an area stretching along the left side of the main stream channel and measuring approximately one hundred meters in diameter.

A second survey of the site by Biglari in 2006 revealed an additional sample of twenty-three artifacts from the same area. This sample consists of large flakes, unifacial handaxes, and a few large cores, one twenty-seven centimeters in length. The artifacts are all made of altered trachyandesite and are generally larger than ten centimeters. There was no smaller debitage, suggesting that the lighter specimens were washed away during seasonal floods of the Tang-e Khozaq. The main characteristic of the Geleh industry is the production of large end and side struck flakes that mostly have no bulb or have only an ambiguous bulb. A few collected cores are also large, between 16 to 27 centimeters in length. No effort was made to shape the flakes after detachment and only a few show some partial retouch. Generally, the industry is dominated by primary stage reduction pieces that suggest Geleh functioned as a workshop. Aside from sources of the raw material, the abundant springs in the vicinity (evidenced by travertine formations), probably attracted hominins to the area. The presence of large unifaces made of side struck flakes, cleaver-like flakes, and a large broken biface with steep retouching along its lateral edges makes it likely that the Geleh industry is a part of the Acheulian industrial complex.

There is more evidence for Lower Paleolithic occupation in the mountainous regions of northwest and western Iran, where environmental conditions may have been more favorable for hominin occupation than dry regions of central and southeastern Iran. This evidence comes from three regions including intermontane valleys and foothills of the western Zagros, east and south of Lake Urmia, and the western Alborz range.

As mentioned earlier, the first recorded Lower Paleolithic find in Iran comes from the west-central Zagros, where a team directed by Braidwood (1960) undertook a prehistoric archaeological survey in some intermontane valleys in the Kermanshah Region in 1959–1960. During a survey of the hilly area of Gakia, about ten kilometers to the east–southeast of Kermanshah, on one of the lower terraces of the Qara-Su River at an altitude of about 1260 meters above sea level, a biface was found in association with numerous flakes and cores. The cores and flakes were assigned to later periods based on their techno-typological characteristics (Singer and Wymer 1978). The biface is 16.5 millimeters in length and has an amygdaloid form.

A new survey of the Gakia area by Biglari and Heydari in 1997 and later by the authors demonstrated that this occurrence is part of a huge and continuous scatter of flint artifacts that are associated with radiolarian chert outcrops. The workshops and chipping floors relate to the manufacture of flint artifacts during different periods of prehistory of which Middle Paleolithic artifacts are the most common. Survey of a hilltop located about five kilometers to north of the handaxe findspot, west of the village of Gakia, revealed some core-choppers, numerous Levallois cores and flakes and lithic artifacts dating to the Chalcolithic/Bronze Ages (Biglari 2004a; Heydari 2004).

The Gakia chert outcrops extend about twenty-five kilometers southeast to the vicinity of Harsin, where a survey by the authors in 2006 revealed two bifaces in association with Levallois cores and debitage, and other Middle Paleolithic artifacts. One of the bifaces measures 85.80 millimeters in length and has a cortical butt, and the other is larger (127 millimeters in length) and made by large removals over one face while the other face bears few large retouch scars. Both are made on local chert nodules and are heavily patinated. Association of these bifaces with Levallois elements makes it somewhat difficult to determine whether they belong to the Acheulian or Mousterian industries. It should be noted that in the Zagros Mousterian assemblages discovered so far in caves and rock-shelter sites, there are only two known bifaces. These were found by Garrod in association with Middle Paleolithic assemblages from Hazar Merd Cave in Iraqi Kurdistan.

The closest analogs to Gakia are found in a similar surface scatter of artifacts associated with raw material sources in the southwestern foothills of the Zagros Mountains some 150 kilometers to the southwest of Gakia. Amar Merdeg consists of a cluster of hills covering approximately six square kilometers to the east of the Konjan-Cham River, north of the town of Mehran and at two to three hundred meters above sea level. These occurrences were recorded and sampled in 1999 by Biglari, Nokandeh, and Heydari (2000). These assemblages consisted of only core-choppers, flake tools, and large numbers of tested cobbles, cores, and cortical debitage. Additional fieldwork in 2001 and 2004 resulted in the discovery of four bifaces and partial bifaces, some Levallois cores and debitage, and more core-choppers.

Chert, sandstone, and quartzite cobbles were the most commonly used raw materials. They are plentiful on the hilltops. High proportions of core-choppers are made from these well-rounded cobbles, as were a handaxe and various types of cores. The handaxe has a thick proximal end that was left completely unretouched, and its distal part is triangular in cross-section. Two of the three sides of the tool are partially retouched while the remaining side was left unretouched. It resembles most closely the illustrated handaxe from Barda Balka in Iraqi Kurdistan at the western foothills of the Zagros (Wright and Howe 1951).

In both the Gakia and Amar Merdeg assemblages there are a few bifaces and a larger number of core-choppers, but no other Lower Paleolithic tool and core types such as cleavers, spheroids, polyhedrons, or core scrapers. These are usually present in various quantities in Acheulian assemblages of western and southern Asia. On the other hand, the presence of large number of various types of Levallois cores and their products characterize these assemblages. Similar surface

sites with Acheulian industries with Levallois elements are reported from southwestern Asia, especially in the Levant (Ronen 1982). Since there is hardly any combination like this in excavated assemblages, we may have essentially mixed assemblages remaining from successive workshops from both the Lower and Middle Paleolithic periods (O. Bar-Yosef, personal communication, 2002).

Another reported Acheulian site from west-central Iran is Pal Barik, recorded by P. Mortensen during his archaeological survey of the Holailan Valley, and located some sixty-five kilometers to the south of the Kermanshah Valley (Mortensen 1993). The site is situated on a flat hilltop overlooking the Saimareh River valley, at an altitude of about 975 meters above sea level. In an area of approximately 50 × 80 meters, he collected a total of eighty-nine heavily patinated artifacts. The assemblage consisted of a relatively small subtriangular biface; large numbers of core-choppers; unipolar, discoid, multiple and irregular cores; retouched tools such as side and end scrapers; notched, denticulated, and other debitages (Mortensen 1993). An additional small biface was found about one kilometer to the southwest of Pal Barik. This core-like biface is biconvex in cross-section and has a twisted profile.

In some respects, for example, the large number of core-choppers and its poor Acheulian component, the assemblage is similar to the assemblages from Gakia and Amar Merdeg, although in the latter sites there are high frequencies of Levallois elements and the Pal Barik assemblage includes only one small Levallois core.

Geomorphological research in the valley indicates that the locality is associated with one of two pediments that extend from the base of the limestone escarpments to the alluvial valley. According to Brookes, who studied the geomorphology of the Holailan valley, these pediments probably predate the last interglacial (Mortensen 1993). Thus, the site may date back to the last interglacial, or somewhat later. As for the Minab and probably the Sarhad localities, the age proposed by Mortensen for Pal Barik is within the early Middle Paleolithic time range.

A team led by Singer and Wymer (1978) conducted a survey for evidence of Lower Paleolithic occupation in the northwestern portion of the country in 1970. Their ten-day survey covered a large region along the main roads connecting Tehran, Tabriz, Kermanshah, and Hamedan. The team failed, however, to recover any secure traces of Lower Paleolithic occupation, except for a single surface find from the Lake Quri Goll vicinity, northeast of the Sahand massif. Here they found an isolated biface on the surface of a low terrace, about one kilometer southeast of the lake, at an altitude of about 1900 meters above sea level. It is a subcordate form handaxe made of quartzitic sandstone and is heavily patinated and worn. Considering the high altitude of this find, it may belong to a warm interval of the Pleistocene because such a high altitude region was too cold and unfavorable to have been occupied during glacial periods.

A biface from Amar Merdeg in the Mehran plain, southwestern Zagros. *Photo courtesy of Markus Schicht.*

The presence of rich and well-preserved fossil beds of Maragheh at the foot of Sahand, encouraged Sadek Koroos (1976) to undertake a preliminary survey for probable evidence of Pliocene–early Pleistocene hominin occupation of the region. Her survey covered stream terraces and rocky regions around the Sahand massif at an altitude between 1400 to 1800 meters above sea level. A total of seven open-air localities and three cave sites were recorded that yielded Lower Paleolithic artifacts (Sadek-Kooros 1976). Artifacts from the open-air occurrences are in secondary context and those reported from caves are collected on terraces in the vicinity of those caves. The collected artifacts include core-choppers, retouched flakes, and cores that were made from chert and other rock types. Based on published images, there are polyhedrons, spheroids, and a probable trihedral pick. Generally, the assemblages resemble Lower Paleolithic simple core and flake industries. But the presence of a probable pick may indicate that the industry is Acheulian.

A recent survey by S. Alipour along Mahabad River to the south of Lake Urmia revealed some Lower Paleolithic localities in 2004. In the same year, a joint Iranian-French team visited and sampled some of these localities, among which Shiwatoo produced the largest number of artifacts (Jaubert *et al.* 2006). This locality, situated about seven kilometers west of Mahabad, lies at an altitude of about 1380 meters above sea level on the left bank of the Mahabad River overlooking Mahabad-Piranshahr road. Over three visits to the site, the team collected nearly one hundred artifacts from an area measuring about one hectare, which slopes twenty-one to twenty-six degrees towards the valley floor.

The presence of many well-rounded pebbles and cobbles testify to an old dismantled alluvial terrace (Jaubert *et al.* 2006). Many of the artifacts were made from these andesite, quartzite, and basalt cobbles, as well as from local basalt and limestone outcrops. The industry consists primarily of cores, tested cobbles, and core-choppers. Unipolar, multiple, and discoid cores were found; some were quite large (one unipolar core is thirty centimeters in length and exhibits some large and elongated scars of previous removals). A number of pebble and cobble cores exhibit bipolar technique (Jaubert *et al.* 2004). The paucity of small pieces in general suggests that the assemblage has undergone some lateral transport over the sloping surface.

The most characteristic find from Shiwatoo is a large cleaver made on a side-struck flake with a relatively straight distal edge. In general, the industry is typified by hard hammer flaking, large cores and flakes, rare retouched pieces, and a few core

forms with bifacial removals that resemble partial bifaces. The industry shows some Acheulian technological characteristics such as the flake cleaver, some bifacially shaped core forms, and large cores and flakes. Other localities with similar industries are Kalakawe, Kani Samburian, and Shakar Bag, which are located south-southwest of Shiwatoo along the Mahabad River (Jaubert *et al.* 2004).

So far, the best evidence for the Acheulian industry in Iran comes from Ganj Par located in the western Alborz range, in northern Iran. This locality, discovered by Biglari and Heydari in 2002, lies at an elevation of about 235 meters above sea level, on the 200–160 meter-high terrace of the Sefidrud in the Rostamabad plain (Biglari, Heydari, and Shidrang 2004). During three visits to the site we collected about 140 artifacts in an area of about half a hectare. All pieces were plotted on topographic map to record all potential information.

Almost half of the assemblage is made from limestone that comes from the local bedrock. A large proportion of the other artifacts are made from sandstone, quartzite, and volcanic rocks such as tuff, andesite, and basalt, which come primarily from secondary gravel sources along Sefid Rud and its left bank tributary of Kaluraz. The presence of some small flakes in the assemblage and the low degrees of abrasion on the artifacts may indicate there was no significant post-depositional disturbance, although there is a possibility that some lighter artifacts washed away.

The assemblage is composed of high frequencies of core-choppers and cores, along with core scrapers, bifaces, large flakes, and hammers. The bifacial assemblage is composed of handaxes, cleavers, a partial hand axe and a pick. About half of the bifaces were made on large flakes. The cleavers and core scrapers found are the first-known examples of these types in a Lower Paleolithic archaeological context in Iran. Cores can be categorized as unipolar, multiple, discoid, and indeterminate. There are also some bipolar cores. Cores vary widely in size and they were almost all made from limestone. During a recent visit, a limestone subspheroid was also found on the site.

The industry shares technological similarities with early and Middle Acheulian assemblages in western Asia, including the use of volcanic rocks as raw material from gravel sources, the presence of large cutting tools, the use of large flakes as blanks, the high frequency of core-choppers, the presence of discoid and anvil flaking along other methods, and the specific use of raw material for production of certain cores and core-tools.

Given the geographic location of Ganj Par close to the Caucasus, its assemblage bears closer resemblance to the Caucasus Acheulian than to the Western Zagros assemblages. The narrow Sefidrud valley, where Ganj Par is located, provides easy passage in two directions, south toward the Iranian central plateau and north of the Zagros, and north to the southern shores of the Caspian Sea and northwest to the Caucasus, a region with a rich Acheulian record (Lioubine 2002).

Some sixteen kilometers east-southeast of Ganj Par, the recently discovered site of Darband has yielded the first-known evidence for Lower Paleolithic occupation in a cave in Iran. The Darband cave and an adjacent larger cave are located on the north side of a deep tributary canyon of the Siahrud River, a tributary of the Sefidrud River that flows into the Caspian Sea. The site lies at an altitude of seventy-five meters above sea level and faces south, on a nearly vertical cliff dominating the deep canyon. Darband is a single chamber cave about twenty-one meters long, with a seven-meter-wide entrance.

V. Jahani located the site in 2005; he collected some faunal remains and potsherds on the floors of both the Darband cave and its neighbor. We visited Darband with Jahani in 2006; that expedition yielded a large number of faunal remains and twenty-five stone artifacts, which were collected from disturbed deposits along the western wall of the cave.

The lithic artifacts are mainly made of chert, followed by silicified tuff, and other volcanic rocks. Chert artifacts are

Darband Cave and its neighboring cave, overlooking a deep canyon. A core-chopper from the Darband lithic collection is shown in the inset. *Photo courtesy of Fereidoun Biglari.*

smaller than those made from other rock types, which may have to do with the small size of the chert nodules. Flakes make up the majority of the artifacts and their platforms are plain or cortical; few are small. The majority of flakes have a high flaking angle (exceeding ninety degrees) mostly between 110 and 124 degrees. Aside from four specimens, all the artifacts show some retouch that allows them to be classified as marginal retouched flakes, scrapers, notched, awls, end-scrapers, and small core-scrapers. Other artifacts consist of a few cores and a core chopper and some flakes and a flake fragment. Most of the artifacts are heavily patinated; the patination on one broken flake measured three millimeters in thickness. A flake with a convex profile and subradial dorsal scar pattern may have been struck from a biface, which in turn could be evidence for the use of biface as core and presence of an Acheulian industry in the site.

The faunal assemblage is dominated by cave bears, along with a few ungulate remains. The presence of large numbers of cave-bear remains in the faunal assemblage and sparse lithic artifacts at the site indicates that Darband primarily represents a bear den. The co-occurrence of artifacts and bear bones does not imply human predation or scavenging. Because there are no clear cut marks except for a few signs of burning on the bear bones, they probably accumulated through natural mortality. Such alternating use of caves by hominins and cave bears is reported from Middle Pleistocene cave sites in the Caucasus and Mediterranean Basin. Remains of cave bear are absent at Paleolithic cave sites in the Zagros region and elsewhere in Iran. Darband represents the first record of this taxon from Iran. The presence of this carnivore at western Alborz seems to be a southeastern extension of Caucasian population of Pleistocene cave bear. Our preliminary observation based on both lithic and faunal assemblages indicates a probable Middle Pleistocene age for the site; meanwhile we have submitted two bear teeth for U-series dating that could help us to put the site in a chronological framework.

Previous Paleolithic investigations in Iran generally have not been as extensive as those in neighboring regions such as the Caucasus and the Indian subcontinent, and only some of this field research has been oriented toward the Lower Paleolithic question specifically. But this brief review, which is based mostly on new Lower Paleolithic discoveries, demonstrates the importance of the Lower Paleolithic record of Iran for understanding hominin adaptation and behavior in broader context of the Western Asia.

The concentration of Lower Paleolithic sites in Northwestern Iran indicates that this region close to the Caucasus has considerable archaeological potential, and more intensive explorations will result in new evidence from primary-context sites such as the one known from Darband Cave. Such stratified sites can provide information on the economic and social behavior of Lower Paleolithic hominins and their environment, and also the opportunity to establish a chronological framework through direct dating of *in situ* archaeological remains.

As for northeastern Iran, the Kashafrud basin deserves the serious attention of geomorphologists and Paleolithic archaeologists in order to establish the context and nature of the industry, which seems provide the earliest evidence for presence of hominins in Iran. In southern Iran, except for the probably late-Acheulian site of Minab near the Strait of Hormoz, there is no evidence for Lower Paleolithic occupations. Although the relative absence of Acheulian sites in southern Iran could be the result of geomorphic factors, and, even more likely, the lack of survey in the region, the presence of large numbers of Acheulian sites in the Arabian peninsula, especially in Oman, shows the potential of the peninsula as a dispersal route from east Africa through the Arabian Peninsula and eventually into the Iranian Plateau. The lowering of sea levels during glaciations could reduce the distance between the Arabian Peninsula and southern Iran at the Strait of Hormoz, where the present-day depth of the strait is about ninety meters.

Large gaps in the distribution of Lower Paleolithic sites in other parts of Iran such as in the central region is clearly due to the lack of survey in these regions rather than the real absence of hominins. The presence of localities such as the probable one mentioned near Kashan, indicates the potential of these unknown regions for Lower Paleolithic investigations that eventually could fill the large gap in the distribution of Lower Paleolithic sites in these regions.

Paleolithic studies are becoming increasingly import among the new generation of Iranian archaeologists, who unlike their predecessors, are interested in devoting their careers to the Paleolithic prehistory of Iran. Certainly, Lower Paleolithic research in Iran, as a part of Paleolithic archaeology, is still taking its first steps, and much work remains to be done by this young generation and its foreign colleagues.

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